

1 WHAT IS CLAIMED IS:

- 1 1. In an optical fiber communications system including an optical fiber, a method for
2 compensating for dispersion effects in the optical fiber, the method comprising:
3 receiving at least two low-speed channels, each low-speed channel allocated a different
4 frequency band of an optical fiber communications system for transmission across
5 the communications system;
6 for each low-speed channel, estimating an attenuation caused by dispersion resulting from
7 transmission of the low-speed channel across the optical fiber in the frequency
8 band allocated to the low-speed channel;
9 adjusting a power of each low-speed channel to compensate for the estimated attenuation
10 caused by dispersion; and
11 frequency division multiplexing the power-adjusted low-speed channels to produce an
12 electrical high-speed channel for transmission across the communications system.
- 1 2. The method of claim 1 wherein the step of adjusting a power of each low-speed channel
2 comprises applying a gain to each low-speed channel which is equal in magnitude to the
3 estimated attenuation for that low-speed channel.
- 1 3. The method of claim 2 wherein the step of adjusting a power of each low-speed channel
2 comprises applying a constant gain to each low-speed channel which is equal in magnitude to the
3 estimated attenuation at a center frequency of the frequency band allocated to the low-speed
4 channel.
- 1 4. The method of claim 1 wherein the step of adjusting a power of each low-speed channel
2 comprises applying a gain ramp to the low-speed channels.
- 1 5. The method of claim 1 wherein the step of estimating an attenuation caused by dispersion
2 comprises estimating an attenuation caused by chromatic dispersion.

1 6. The method of claim 1 wherein the step of estimating an attenuation caused by dispersion
2 comprises estimating an attenuation caused by polarization mode dispersion.

1 7. An optical fiber communications system for transmitting at least two low-speed channels
2 across the communications system, the communications system comprising:

3 a variable gain block for adjusting a power of each low-speed channel to compensate for
4 an estimated attenuation caused by dispersion resulting from transmission of the
5 low-speed channel across an optical fiber in a frequency band allocated to the
6 low-speed channel; and

7 a FDM multiplexer coupled to the variable gain block for combining the power-adjusted
8 low-speed channels into an electrical high-speed channel suitable for transmission
9 across the communications system.

1 8. The communications system of claim 7 wherein the variable gain block applies a gain to
2 each low-speed channel which is equal in magnitude to the estimated attenuation for that low-
3 speed channel.

1 9. The communications system of claim 8 wherein the variable gain block applies a constant
2 gain to each low-speed channel which is equal in magnitude to the estimated attenuation at a
3 center frequency of the frequency band allocated to the low-speed channel.

1 10. The communications system of claim 7 wherein the variable gain block applies a gain
2 ramp to the low-speed channels.

1 11. The communications system of claim 7 wherein the variable gain block is for adjusting a
2 power of each low-speed channel to compensate for an estimated attenuation caused by
3 chromatic dispersion.

- 1 12. The communications system of claim 7 wherein the variable gain block is for adjusting a
2 power of each low-speed channel to compensate for an estimated attenuation caused by
3 polarization mode dispersion.

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